Ammann, Caspar, NCAR; D'Arrigo, Roseanne, Columbia University; Graham, Nicholas,Hydrologic Research Center

The Paleoclimate Reconstruction (PR) Challenge: A Community Program to Benchmark Methods Used to Reconstruct the Climate of the Last 1-2000 Years

2008

Abstract: Detailed understanding of the full range of past climate variability forms an important basis for the interpretation of the observed record and for gauging the response of the climate system to various forcings. The various methods and proxy networks used to reconstruct past climates exhibit many similarities, yet there are also important differences. It is unclear how much these differences result from either the selection of specific proxy networks, the potential inability of the included proxies to resolve information on all time scales, or the algorithms themselves. In this project, we assess the skill of different climate reconstruction methods by using synthetic climate proxy data derived from climate model output. Better understanding of the strengths and weaknesses of the reconstruction procedures is essential and will lead to a reduction of uncertainties and promote further convergence of our knowledge about the recent past.
We propose a last millennium Paleoclimate Reconstruction (PR) Challenge that offers: (1) an open and transparent platform for archiving, documentation, and dissemination of paleoclimate reconstruction methods; (2) a systematic evaluation and objective benchmarking of the skill of reconstruction procedures. This will be accomplished by applying realistic —pseudo-proxies derived from long simulations with state-of-the-art coupled Atmosphere-Ocean General Circulation Models (AOGCMs) in both open and blind-test reconstruction exercises as a well-controlled surrogate for the real world situation; (3) a strong motivation for the paleo community to explore reconstructions beyond mean annual or summer temperature and to attempt explicit seasonal as well as nontemperature reconstructions at hemispheric and regional scales; (4) to bring together the paleo, modeling and statistics communities to interact and to jointly assess the current level of knowledge and uncertainty in reconstructions andmodeling of the last millennium climate.
The open access philosophy of this international cross-community effort will rekindle progress through collaborations across the disciplinary boundaries. Through these activities, the PRChallenge will support and steer research to develop strategies for improving the reconstruction methods so that past climate variations can be better understood. A well-verified historical record forms the foundation from which assessment and predictions of future climate can happen.Providing the scientific communities with an opportunity for inspection and assessment of that climate baseline is the primary goal of this activity.